REMARKS

§ 102 Rejections

The Examiner rejected claims 1, 4, 10-11, and 13 under 35 U.S.C. § 102 as being anticipated by the admitted prior art of Figure 15. Claim 1 recites an optical density sensor including a collimator "extending into said integrating cavity." The term "into" means "to the inside or interior of." (dictionary.com). Prior art optical density sensors such as that depicted in Figure 15 do not have a collimator that extends to the inside or interior of the integrating cavity. Rather, the collimator is flush with the surface of the integrating cavity. The benefit of extending the collimator into the integrating cavity is discussed in Applicant's specification at paragraph 0034:

> According to the present invention, the collimator 118 extends into the integrating cavity 112. This configuration presents several advantages. Bringing the tip of the collimator 118 closer to the target surface 122 reduces the degree of collimation needed because there is less distance for the light to diverge and consequently hit an interior surface 114 of the cavity 112. A lower level of collimation means the collimator 118 can be shorter, bringing the optical source 116 even closer to the target surface 122. The closer proximity of the optical source 116 to the target surface 122 and the reduced losses in the shorter collimator 118 greatly increase the collimator 118 efficiency, as measured by the amount of light hitting the target surface 122. This may allow in a reduction in the drive current for the optical source 116 (such as when the optical source 116 is an LED), and the use of a smaller, lower cost optical detector 124. Furthermore, the improved signal-to-noise ratio allows the use of unshielded conductors 125 to the photodiode, further reducing cost.

This disclosure – in particular the underlined portion – verifies that the applicant intended the phrase, "extending into the integrating cavity," to have its plain and ordinary meaning of extending "to the inside or interior of" the integrating cavity, bringing the collimator closer to the target surface, with the concomitant advantages of that arrangement as explained above.

Under 35 USC §102, every element or limitation of a claim must identically appear in a single prior art reference for it to anticipate the claim. *In re Bond*, 910 F.2d 831, 832 (Fed. Cir. 1990). Further, anticipation requires that the single prior art reference disclose every element of the claimed invention arranged in the same manner as claimed. *Lindemann Maschinenfabrik v. American Hoist & Derrick Co.*, 730 F.2d 1452, 1458 (Fed. Cir. 1984). The admitted prior art does not disclose a collimator "extending into said integrating cavity," an express limitation of claim 1. Accordingly, the § 102 rejections over the admitted prior art are improper and must be withdrawn.

§ 103 Rejections: Claims 2-17

Neither Takeuchi, Genovese, Parker, Dalton, Moberg, nor Shimada, alone or in combination, cure the failure of the admitted prior art to disclose a collimator extending into the integrating cavity of an optical density sensor. Each of claims 2-17 depend directly or indirectly from claim 1. Each dependent claim includes every limitation of its parent claim(s), including the limitation of a collimator extending into the integrating cavity. Since none of the combinations with the admitted prior art disclose each and every limitation of the associated claim, the § 103 rejections of claims 2-17 are improper and must be withdrawn.

§ 103 Rejections: Claims 18-25

Claim 18 recites an optical density sensor having an optical source drive circuit or an optical detector sensing circuit on a circuit card disposed proximate the optical source and optical detector. The Examiner rejected claim 18 under § 103 in view of the admitted prior art in combination with Parker. The Examiner cited to col. 8, lines 47-57 of Parker, asserting that Parker disclosed the circuit card limitation. The cited passage of Parker is set out below.

> Each of the clusters of FIG. 6 is electrically driven by one of the five adaptive light control drive circuits 80_1 -80_5, typified by the center

> most LED drive circuit 80_1 schematically illustrated in FIG. 7 together with the common components of the illumination controller 16 and the feedback photodetector 20. In FIG. 7, the LEDs 70_{n+1}, 70_{n+2} 70_{n+3}, and 70_9 are connected electrically in series through a current bypass switch 82 as an LED cluster load to drive transistor 84. Energizing the drive transistor 84 causes current to flow through the cluster of LEDs, and the LEDs emit infra-red light of an intensity dependent on the applied current level.

Nothing in this passage – or anywhere else in Parker – discloses that LED drive circuits or photodetector sensing circuits are mounted on a circuit card at all, or, if they are, that the card is disposed proximate an optical source and optical detector. Parker's Figure 1 indicates that the photodetector 20 providing a feedback signal is disposed proximate the integrating cavity 12 that contains the LEDs. Figure 1 also indicates that the illumination controller 16 – which houses the optical source drive circuits and optical detector sensing circuits (whether on a circuit card or otherwise) – is remote from the integrating cavity 12 and photodetector 20. Nothing in Parker suggests that close proximity between optical source drive circuits or optical detector sensing circuits, and the optical source and detector, is necessary or even advantageous to its linear light beam. Accordingly, Parker does not teach or suggest the claimed proximity. For at least the reason that the combination of admitted prior art and Parker fails to teach or suggest every claim limitation, the § 103 rejections of claim 18 and all claims depending therefrom are improper and must be withdrawn.

To establish a *prima facie* case of obviousness based on a combination of prior art references, the Examiner must articulate sufficient suggestion or motivation to modify or to combine the prior art teachings. MPEP § 2143. The Examiner stated that it would have been obvious to modify the apparatus disclosed in the admitted prior art to include a circuit card proximate the optical source and detector "to increase operational efficiencies." Parker – which does not disclose locating drive or sensing circuits proximate an optical source and detector – does not teach or suggest that doing so

would increase any operational efficiencies. The only teaching of any operational inefficiencies in the admitted prior art optical density sensor are found in Applicant's specification at, *inter alia*, paragraph 006. The only teaching of any increase in operational efficiency by locating the circuits proximate the optical source and detector is found in Applicant's specification at, *inter alia*, paragraph 0042.

The teachings in a patent application may not be used as the basis for a motivation to combine or modify the prior art to support a § 103 rejection. *ACS Hosp. Sys., Inc. v. Montefiore Hosp.*, 732 F.2d 1572 (Fed. Cir 1984). *See also In re Dow Chem. Co.*, 837 F.2d 469, 473 (Fed. Cir 1988) (both the suggestion and reasonable expectation of success must be found in the prior art, and not in the applicant's disclosure). For at least the additional reason that the Examiner has not articulated a legally sufficient motivation to combine the references, the § 103 rejections of claims 18-25 are improper and must be withdrawn.

§ 103 Rejections: Claims 26-35

Claim 26 recites an optical density sensor having an integrating cavity, with "a compensating slot formed in said integrating cavity and positioned to allow light reflected from said surface to directly strike said optical detector." Neither the admitted prior art nor Mosberg disclose a compensating slot positioned to allow reflected light to directly strike an optical detector.

Moberg discloses (see Figure 1) a light integrating cavity 18 having a light input port 17 into which light rays 15 from a light source 14 are directed by an optical system 16. The light is diffusely reflected by the interior surface of the integrating cavity 18, and emerges from an elongated slot 28 for exposing photographic film. To compensate for fluctuations in light intensity caused by arc wander of a xenon arc lamp, light is directed from a feedback port 20 in the integrating cavity 18, through fiber optic cable 22, to an

optical detector 24. Light entering the feedback port 20 does not "directly strike said optical detector." Rather, it is directed to the detector via a fiber-optic cable 22. Furthermore, the use of a waveguide such as the fiber-optic cable 22 means that the feedback port 20 may be positioned anywhere on the integrating cavity 18. As such, Moberg additionally fails to disclose a compensating slot "positioned to allow" reflected light to directly strike the optical detector. Still further, Moberg discloses that a light diffusing member 34 is advantageously interposed between the integrating cavity 18 and the fiber optic cable 22. By this disclosure, Moberg teaches away from any light directly striking the optical detector.

For at least the reason that the combination of admitted prior art and Moberg fails to teach or suggest every claimed limitation, the § 103 rejections of claims 26-35 are improper, and must be withdrawn. Furthermore, the Examiner offered the same motivation to combine the references – that adding a compensating slot to the admitted prior art would "increase operational efficiencies." As discussed above, the only teaching of inefficiencies in the admitted prior art, and the only suggestion of increased operational inefficiency in an optical density a sensor having a compensating slot are found in Applicant's specification, and cannot provide a motivation for modifying or combining the prior art in support of a § 103 rejection. For at least this additional reason, the § 103 rejections of claims 26-35 are improper, and must be withdrawn.

§ 103 Rejections: Claims 36-37

Claim 36 recites an optical density sensor having a collimator extending into the integrating cavity. As discussed above with respect to claim 1, the admitted prior art does not disclose a collimator extending into the interior of the integrating cavity, and neither Parker nor Moberg provide any such disclosure. For at least this reason, claims 36-37 define patentable nonobviousness over the prior art.

Claim 36 additionally recites a circuit card disposed proximate the optical source and detector. As discussed above with respect to claim 18, Parker does not teach or suggest locating a circuit card proximate the optical source and detector. For at least this reason, the § 103 rejections of claims 36-37 are improper and must be withdrawn.

Claim 36 further recites a compensating slot positioned to allow light to directly strike the optical detector. As discussed above with respect to claim 26, Moberg does not disclose light directly striking an optical detector, and does not disclose a compensating slot positioned so as to allow light to directly strike an optical detector. For at least these reasons, the § 103 rejections of claims 36-37 are improper and must be withdrawn.

The Examiner offered the same motivation to combine the references – that adding a circuit card proximate the optical source and detector and a compensating slot to the admitted prior art would "increase operational efficiencies." As discussed above, the only teaching of inefficiencies in the admitted prior art, and the only suggestion of increased operational efficiency in an optical density a sensor having a circuit card proximate the optical source and detector and a compensating slot are found in Applicant's specification, and cannot provide a motivation for modifying or combining the prior art in support of a § 103 rejection. For at least this additional reason, the § 103 rejections of claims 36-37 are improper and must be withdrawn.

§ 103 Rejections: Claims 38-40

Claim 38 recites a method of sensing toner using the optical density sensor of claim 26. As discussed above with respect to claim 26, none of the prior art, alone or in combination, discloses sensing light reflected from a surface that directly strikes an optical detector disposed within an integrating cavity. The only reflected light that reaches Moberg's optical detector does so via an optical fiber cable. Accordingly,

Moberg does not teach or suggest "sensing light reflected from said source by said surface that directly strikes said optical detector," as recited in claim 38. For at least the reason that the proposed combination of prior art references fails to teach or suggest every claimed limitation, the § 103 rejections of claims 38-40 are improper and must be withdrawn.

Additionally, as discussed extensively above, the proffered motivation "to increase operational efficiencies" of the prior art optical density sensor is found only in Applicant's specification, and as such cannot support a *prima facie* case of obviousness under § 103.

All pending claims exhibit patentable novelty and nonobviousness over the art of record. Prompt allowance of all pending claims is therefore respectfully requested.

Respectfully submitted,

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